LOW ENERGY WI-FI® COMMUNICATIONS FOR THE IOT IN A WIDE AREA

TECNOLOGÍA PATENTADA

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RESUMEN

The invention consists in a communications system to send/receive data blocks (700 bytes maximum) between a base station and a set of Wi-Fi® sensors without any active data link (active Wi-Fi® network connection). A base station has a coverage area between 12 km^2 and 30 km^2 without obstacles.

The system provides broadcasting and unicasting communication modes. It's the most efficient solution for unidirectional communication of the sensors to a base station. It reduces the power consumption of Wi-Fi® chipsets (does not require an active Wi-Fi® connection) and provides more security because it's immune to the DoS attacks on Wi-Fi® WPA2 chipsets.

The technology can be used in applications for the Internet of Things (IoT) in order to interchange data between sensors and Internet using a single Internet connection in the base station.

VENTAJAS Y ASPECTOS INNOVADORES

MAIN ADVANTAGES OF THE TECHNOLOGY

The technology provides a set of advantages to improve limitations of communications between Wi-Fi® sensors and Internet:

- Reduces the power consumption of Wi-Fi® sensors when sending/receiving data.
- Increases the coverage area for a Wi-Fi® communication from 100 meters until 3 kilometers, according to the prototype used.
- Reduces the infrastructure costs, substituting multiple Wi-Fi® access points for a single base station.
- Reduces the economic costs of the Internet connectivity of the sensors. It uses a single Internet connectivity at the base station, therefore, it not exist an economic cost associated with each sensor.
- Immunity to WPA2 Wi-Fi® DoS (Denial of Service) attacks of authentication, allowing the use of WPA2 chipsets with total security.
- Communications encryption using pre-installed 128-bit AES keys.
- Compatibility with Wi-Fi® 802.11ah (Wi-Fi® HaLow) chipsets that allow greater carrier range in the ISM 900 MHz band.

INNOVATIVE ASPECTS

The main innovations are the reduction of power consumption and the increase in coverage area for Wi-Fi® sensors in the Internet of the Things (IoT) applications, using the Wi-Fi® WPA2 chipsets already on the market.

APLICACIONES DE LA OFERTA

The technology can be applied in IoT solutions where there is the need to use low power and wide area Wi-Fi® communications with sensors. For example:

- Sensor deployments for agriculture applications (smart farms).
- Sensor deployments for big infrastructures (stadiums, bridges, sea ports, etc.)
- Sensor deployments in areas with no coverage of mobile data service (GSM/UMTS) like forests, high mountain or sea.

COLABORACIÓN BUSCADA

Researchers are looking for companies acquiring the technology for implementation in their products. It is possible to reach license agreements.